

SEQUENCE LISTING

<110> Yanagi, Masayuki
Emerson, Suzanne
Bukh, Jens
Purcell, Robert

<120> Cloned Genome of Infectious Hepatitis C Viruses of
Genotype 2a and Uses Thereof

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<140> TBA

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<150> 60/137,693

<151> 1999-06-04

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<170> PatentIn Ver. 2.1

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Arg Gly Leu Leu Gly Thr Ile Val Val Ser Met Thr Gly Arg Asp Lys			
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Thr Glu Gln Ala Gly Glu Ile Gln Val Leu Ser Thr Val Thr Gln Ser			
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Phe Leu Gly Thr Ser Ile Ser Gly Val Leu Trp Thr Val Tyr His Gly			
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Ala Gly Asn Lys Thr Leu Ala Gly Ser Arg Gly Pro Val Thr Gln Met			
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Tyr Ser Ser Ala Glu Gly Asp Leu Val Gly Trp Pro Ser Pro Pro Gly			
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Thr Lys Ser Leu Glu Pro Cys Thr Cys Gly Ala Val Asp Leu Tyr Leu			
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Val Thr Arg Asn Ala Asp Val Ile Pro Ala Arg Arg Arg Gly Asp Lys			
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Arg Gly Ala Leu Leu Ser Pro Arg Pro Leu Ser Thr Leu Lys Gly Ser			
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Ser Gly Gly Pro Val Leu Cys Pro Arg Gly His Ala Val Gly Val Phe			
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Arg Ala Ala Val Cys Ser Arg Gly Val Ala Lys Ser Ile Asp Phe Ile			
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Pro Val Glu Thr Leu Asp Ile Val Thr Arg Ser Pro Thr Phe Ser Asp			
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Asn Ser Thr Pro Pro Ala Val Pro Gln Thr Tyr Gln Val Gly Tyr Leu			
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His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Val Ala Tyr			
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Thr Leu Gly Phe Gly Ala Tyr Leu Ser Lys Ala His Gly Ile Asn Pro
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Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ala Gly Gly
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Ile Pro Phe Tyr Gly Arg Ala Ile Pro Leu Ser Tyr Ile Lys Gly Gly
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Ser Met Met Ala Phe Ser Ala Ala Leu Thr Ser Pro Leu Ser Thr Ser	1795	1800	1805
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Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val Asp Ile Leu	1845	1850	1855
Ala Gly Tyr Gly Ala Gly Ile Ser Gly Ala Leu Val Ala Phe Lys Ile	1860	1865	1870
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Gly Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Ile Cys Ala Ala	1890	1895	1900
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Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ala Pro Thr	1925	1930	1935
His Tyr Val Thr Glu Ser Asp Ala Ser Gln Arg Val Thr Gln Leu Leu	1940	1945	1950
Gly Ser Leu Thr Ile Thr Ser Leu Leu Arg Arg Leu His Asn Trp Ile	1955	1960	1965
Thr Glu Asp Cys Pro Ile Pro Cys Gly Gly Ser Trp Leu Arg Asp Val	1970	1975	1980
Trp Asp Trp Val Cys Thr Ile Leu Thr Asp Phe Lys Asn Trp Leu Thr	1985	1990	1995
Ser Lys Leu Phe Pro Lys Met Pro Gly Leu Pro Phe Val Ser Cys Gln	2005	2010	2015

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<213> Hepatitis C virus

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Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
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Ile Pro Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly
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Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp

85

90

95

Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro
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Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Val Val Gly Ala Pro Leu
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Gly Val Asn Phe Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
 165 170 175

Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Ala
 180 185 190

Glu Val Lys Asn Ile Ser Thr Gly Tyr Met Val Thr Asn Asp Cys Thr
 195 200 205

Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro
 210 215 220

Gly Cys Val Pro Cys Glu Lys Val Gly Asn Ala Ser Gln Cys Trp Ile
 225 230 235 240

Pro Val Ser Pro Asn Val Ala Val Gln Arg Pro Gly Ala Leu Thr Gln
 245 250 255

Gly Leu Arg Thr His Ile Asp Met Val Val Met Ser Ala Thr Leu Cys
 260 265 270

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Gly Val Met Leu Ala Ala
 275 280 285

Gln Met Phe Ile Val Ser Pro Gln His His Trp Phe Val Gln Asp Cys
 290 295 300

Asn Cys Ser Ile Tyr Pro Gly Thr Ile Thr Gly His Arg Met Ala Trp
 305 310 315 320

Asp Met Met Met Asn Trp Ser Pro Thr Ala Thr Met Ile Leu Ala Tyr
 325 330 335

Ala Met Arg Val Pro Glu Val Ile Ile Asp Ile Ile Ser Gly Ala His

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Trp Gly Val Met Phe Gly Leu Ala Tyr Phe Ser Met Gln Gly Ala Trp		
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370	375	380
Thr His Thr Val Gly Gly Ser Ala Ala Gln Thr Thr Gly Arg Leu Thr		
385	390	395 400
Ser Leu Phe Asp Met Gly Pro Arg Gln Lys Ile Gln Leu Val Asn Thr		
405	410	415
Asn Gly Ser Trp His Ile Asn Arg Thr Ala Leu Asn Cys Asn Asp Ser		
420	425	430
Leu His Thr Gly Phe Ile Ala Ser Leu Phe Tyr Thr His Ser Phe Asn		
435	440	445
Ser Ser Gly Cys Pro Glu Arg Met Ser Ala Cys Arg Ser Ile Glu Ala		
450	455	460
Phe Arg Val Gly Trp Gly Ala Leu Gln Tyr Glu Asp Asn Val Thr Asn		
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Pro Glu Asp Met Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Gln Cys		
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Pro Ser Pro Val Val Val Gly Thr Thr Asp Arg Leu Gly Ala Pro Thr		
515	520	525
Tyr Thr Trp Gly Glu Asn Glu Thr Asp Val Phe Leu Leu Asn Ser Thr		
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545	550	555 560
Gly Tyr Thr Lys Thr Cys Gly Ala Pro Pro Cys Arg Thr Arg Ala Asp		
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Phe Asn Ala Ser Thr Asp Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys		
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His Pro Asp Thr Thr Tyr Leu Lys Cys Gly Ser Gly Pro Trp Leu Thr		

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625	630	635 640
Glu His Arg Leu Thr Ala Ala Cys Asn Phe Thr Arg Gly Asp Arg Cys		
645	650	655
Asn Leu Glu Asp Arg Asp Arg Ser Gln Leu Ser Pro Leu Leu His Ser		
660	665	670
Thr Thr Glu Trp Ala Ile Leu Pro Cys Ser Tyr Ser Asp Leu Pro Ala		
675	680	685
Leu Ser Thr Gly Leu Leu His Leu His Gln Asn Ile Val Asp Val Gln		
690	695	700
Phe Met Tyr Gly Leu Ser Pro Ala Leu Thr Lys Tyr Ile Val Arg Trp		
705	710	715 720
Glu Trp Val Ile Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys		
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Ala Cys Leu Trp Met Leu Ile Leu Leu Gly Gln Ala Glu Ala Ala Leu		
740	745	750
Glu Lys Leu Val Ile Leu His Ala Ala Ser Ala Ala Ser Cys Asn Gly		
755	760	765
Phe Leu Tyr Phe Val Ile Phe Phe Val Ala Ala Trp Tyr Ile Lys Gly		
770	775	780
Arg Val Val Pro Leu Ala Thr Tyr Ser Leu Thr Gly Leu Trp Ser Phe		
785	790	795 800
Ser Leu Leu Leu Leu Ala Leu Pro Gln Gln Ala Tyr Ala Leu Asp Thr		
805	810	815
Glu Val Ala Ala Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala		
820	825	830
Leu Thr Leu Ser Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp		
835	840	845
Trp Leu Gln Tyr Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp		

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Val Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu		
865	870	875 880
Met Cys Val Val His Pro Thr Leu Val Phe Asp Ile Thr Lys Leu Leu		
885	890	895
Leu Ala Ile Phe Gly Pro Leu Trp Ile Leu Gln Ala Ser Leu Leu Lys		
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Val Pro Tyr Phe Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu		
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Ala Arg Lys Ile Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys		
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Arg Asp Trp Ala His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu		
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Pro Val Val Phe Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala		
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Asp Thr Ala Ala Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala		
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Arg Arg Gly Gln Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser		
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Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr		
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Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Thr Gln Thr		
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Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly		
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Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met		
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Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly		

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Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr			
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Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly			
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Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu			

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Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly		
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Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser		
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Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile		
1445	1450	1455
Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro		
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Thr Phe Thr Ile Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg		
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Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg		
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Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val		
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Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro		
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Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly		
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Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly		
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Glu Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg		
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Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu		

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Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser		
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Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro		
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Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Gln Glu Phe Asp Glu Met		
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Glu Glu Cys Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu		
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Arg His Ala Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys		
1745	1750	1755 1760
Leu Glu Val Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile		
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Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile		
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Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro		

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Ile Leu Arg Arg His Val Gly	Pro Gly Glu Gly Ala Val	Gln Trp Met
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His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu		
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Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile		
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Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile		
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Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys		
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Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln		
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Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg		
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Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly
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Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala
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Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg
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Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala
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Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly
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Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu
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Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly
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Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu
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Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile
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His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu
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Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu
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Pro Pro Pro Arg Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr
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<213> Hepatitis C virus

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<211> 3015

<212> PRT

<213> Hepatitis C virus

<400> 8

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				20					25					30	

Gly	Val	Tyr	Leu	Leu	Pro	Arg	Arg	Gly	Pro	Arg	Leu	Gly	Val	Arg	Ala
				35				40					45		

Thr	Arg	Lys	Thr	Ser	Glu	Arg	Ser	Gln	Pro	Arg	Gly	Arg	Arg	Gln	Pro
		50					55				60				

Ile	Pro	Lys	Asp	Arg	Arg	Ser	Thr	Gly	Lys	Ser	Trp	Gly	Lys	Pro	Gly
	65					70				75					80

Tyr	Pro	Trp	Pro	Leu	Tyr	Gly	Asn	Glu	Gly	Leu	Gly	Trp	Ala	Gly	Trp
				85						90				95	

Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro
 100 105 110

Arg His Arg Ser Arg Asn Val Gly Lys Val Ile Asp Thr Leu Thr Cys
 115 120 125

Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Val Val Gly Ala Pro Leu
 130 135 140

Gly Gly Val Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
 145 150 155 160

Gly Val Asn Phe Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
 165 170 175

Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Ala
 180 185 190

Glu Val Lys Asn Ile Ser Thr Gly Tyr Met Val Thr Asn Asp Cys Thr
 195 200 205

Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro
 210 215 220

Gly Cys Val Pro Cys Glu Lys Val Gly Asn Ala Ser Gln Cys Trp Ile
 225 230 235 240

Pro Val Ser Pro Asn Val Ala Val Gln Arg Pro Gly Ala Leu Thr Gln
 245 250 255

Gly Leu Arg Thr His Ile Asp Met Val Val Met Ser Ala Thr Leu Cys
 260 265 270

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Gly Val Met Leu Ala Ala
 275 280 285

Gln Met Phe Ile Val Ser Pro Gln His His Trp Phe Val Gln Asp Cys
 290 295 300

Asn Cys Ser Ile Tyr Pro Gly Thr Ile Thr Gly His Arg Met Ala Trp
 305 310 315 320

Asp Met Met Met Asn Trp Ser Pro Thr Ala Thr Met Ile Leu Ala Tyr
 325 330 335

Ala Met Arg Val Pro Glu Val Ile Ile Asp Ile Ile Ser Gly Ala His
 340 345 350

Trp Gly Val Met Phe Gly Leu Ala Tyr Phe Ser Met Gln Gly Ala Trp
 355 360 365

Ala Lys Val Val Val Ile Leu Leu Leu Ala Ala Gly Val Asp Ala Arg
 370 375 380

Thr His Thr Val Gly Gly Ser Ala Ala Gln Thr Thr Gly Arg Leu Thr
 385 390 395 400

Ser Leu Phe Asp Met Gly Pro Arg Gln Lys Ile Gln Leu Val Asn Thr
 405 410 415

Asn Gly Ser Trp His Ile Asn Arg Thr Ala Leu Asn Cys Asn Asp Ser
 420 425 430

Leu His Thr Gly Phe Ile Ala Ser Leu Phe Tyr Thr His Ser Phe Asn
 435 440 445

Ser Ser Gly Cys Pro Glu Arg Met Ser Ala Cys Arg Ser Ile Glu Ala
 450 455 460

Phe Arg Val Gly Trp Gly Ala Leu Gln Tyr Glu Asp Asn Val Thr Asn
 465 470 475 480

Pro Glu Asp Met Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Gln Cys
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Gly Val Val Ser Ala Lys Thr Val Cys Gly Pro Val Tyr Cys Phe Thr
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Pro Ser Pro Val Val Val Gly Thr Thr Asp Arg Leu Gly Ala Pro Thr
 515 520 525

Tyr Thr Trp Gly Glu Asn Glu Thr Asp Val Phe Leu Leu Asn Ser Thr
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Arg Pro Pro Leu Gly Ser Trp Phe Gly Cys Thr Trp Met Asn Ser Ser
 545 550 555 560

Gly Tyr Thr Lys Thr Cys Gly Ala Pro Pro Cys Arg Thr Arg Ala Asp
 565 570 575

Phe Asn Ala Ser Thr Asp Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys
 580 585 590

His Pro Asp Thr Thr Tyr Leu Lys Cys Gly Ser Gly Pro Trp Leu Thr
 595 600 605

Pro Arg Cys Leu Ile Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys
 610 615 620

Thr Val Asn Tyr Thr Ile Phe Lys Ile Arg Met Tyr Val Gly Gly Val
 625 630 635 640

Glu His Arg Leu Thr Ala Ala Cys Asn Phe Thr Arg Gly Asp Arg Cys
 645 650 655

Asn Leu Glu Asp Arg Asp Arg Ser Gln Leu Ser Pro Leu Leu His Ser
 660 665 670

Thr Thr Glu Trp Ala Ile Leu Pro Cys Ser Tyr Ser Asp Leu Pro Ala
 675 680 685

Leu Ser Thr Gly Leu Leu His Leu His Gln Asn Ile Val Asp Val Gln
 690 695 700

Phe Met Tyr Gly Leu Ser Pro Ala Leu Thr Lys Tyr Ile Val Arg Trp
 705 710 715 720

Glu Trp Val Ile Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys
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Ala Cys Leu Trp Met Leu Ile Leu Leu Gly Gln Ala Glu Ala Ala Leu
 740 745 750

Glu Lys Leu Val Ile Leu His Ala Ala Ser Ala Ala Ser Cys Asn Gly
 755 760 765

Phe Leu Tyr Phe Val Ile Phe Phe Val Ala Ala Trp Tyr Ile Lys Gly
 770 775 780

Arg Val Val Pro Leu Ala Thr Tyr Ser Leu Thr Gly Leu Trp Ser Phe
 785 790 795 800

Ser Leu Leu Leu Leu Ala Leu Pro Gln Gln Ala Tyr Ala Leu Asp Thr
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Glu Val Ala Ala Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala
 820 825 830

Leu Thr Leu Ser Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp
 835 840 845

Trp Leu Gln Tyr Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp
 850 855 860

Val Pro Pro Leu Asn Val Arg Gly Gly Val
865 870

Met Cys Val Val His Pro Thr Leu Val His
885

Leu Ala Ile Phe Gly Pro Leu Trp Ile Val
900 905

Val Pro Tyr Phe Val Arg Val Gln Gly Leu
915 920

Ala Arg Lys Ile Ala Gly Gly His Tyr Val
930 935

Leu Gly Ala Leu Thr Gly Thr Tyr Val Thr
945 950

Arg Asp Trp Ala His Asn Gly Leu Arg Val
965

Pro Val Val Phe Ser Arg Met Glu Thr Thr
980 985

Asp Thr Ala Ala Cys Gly Asp Ile Ile Thr
995 1000

Arg Arg Gly Gln Glu Ile Leu Leu Gly Thr
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Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr
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Arg Gly Leu Leu Gly Cys Ile Ile Thr Thr
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Asn Gln Val Glu Gly Glu Val Gln Ile Thr
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Phe Leu Ala Thr Cys Ile Asn Gly Val Thr
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Ala Gly Thr Arg Thr Ile Ala Ser Pro Thr
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Tyr Thr Asn Val Asp Gln Asp Leu Val Thr
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Ser Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu
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Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser
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Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser
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Ser Gly Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Leu Phe
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Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile
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Pro Val Glu Asn Leu Gly Thr Thr Met Arg Ser Pro Val Phe Thr Asp
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Asn Ser Ser Pro Pro Ala Val Pro Gln Ser Phe Gln Val Ala His Leu
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His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr
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Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala
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Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro
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Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr
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Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly
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Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr
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Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly
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Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr
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Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu
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Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly
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Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala
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Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly
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Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser
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Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile
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Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro
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Thr Phe Thr Ile Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg
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Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg
1490 1495 1500

Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val
1505 1510 1515 1520

Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro
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Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu
1540 1545 1550

Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly
1555 1560 1565

Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly
1570 1575 1580

Glu Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg
1585 1590 1595 1600

Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile
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Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu
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Gly Ala Val Gln Asn Glu Val Thr Leu Thr His Pro Ile Thr Lys Tyr			
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Ile Met Thr Cys Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp			
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Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser			
1665	1670	1675	1680
Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro			
1685	1690	1695	
Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Gln Glu Phe Asp Glu Met			
1700	1705	1710	
Glu Glu Cys Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu			
1715	1720	1725	
Ala Glu Gln Phe Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser			
1730	1735	1740	
Arg His Ala Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys			
1745	1750	1755	1760
Leu Glu Val Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile			
1765	1770	1775	
Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala			
1780	1785	1790	
Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly			
1795	1800	1805	
Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu			
1810	1815	1820	
Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly			
1825	1830	1835	1840
Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu			
1845	1850	1855	
Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile			
1860	1865	1870	
Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro			
1875	1880	1885	

Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val Cys Ala Ala			
1890	1895	1900	
Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met			
1905	1910	1915	1920
Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr			
1925	1930	1935	
His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu			
1940	1945	1950	
Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile			
1955	1960	1965	
Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile			
1970	1975	1980	
Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys			
1985	1990	1995	2000
Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln			
2005	2010	2015	
Arg Gly Tyr Arg Gly Val Trp Arg Gly Asp Gly Ile Met His Thr Arg			
2020	2025	2030	
Cys His Cys Gly Ala Glu Ile Thr Gly His Val Lys Asn Gly Thr Met			
2035	2040	2045	
Arg Ile Val Gly Pro Arg Thr Cys Arg Asn Met Trp Ser Gly Thr Phe			
2050	2055	2060	
Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Leu Pro Ala Pro			
2065	2070	2075	2080
Asn Tyr Lys Phe Ala Leu Trp Arg Val Ser Ala Glu Glu Tyr Val Glu			
2085	2090	2095	
Ile Arg Arg Val Gly Asp Phe His Tyr Val Ser Gly Met Thr Thr Asp			
2100	2105	2110	
Asn Leu Lys Cys Pro Cys Gln Ile Pro Ser Pro Glu Phe Phe Thr Glu			
2115	2120	2125	
Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro Cys Lys Pro Leu			
2130	2135	2140	

Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val
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Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala Val Leu Thr
 2165 2170 2175

Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg
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Arg Leu Ala Arg Gly Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser
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Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp
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Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu
 2225 2230 2235 2240

Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile
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Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val
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Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg Ala
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Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr
 2290 2295 2300

Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu
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Pro Pro Pro Arg Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr
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Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala
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Thr Lys Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn
 2355 2360 2365

Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser
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Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly
 2385 2390 2395 2400

Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser Ser Gly Ala			
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Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val Thr Phe Asp Arg			
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Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly			
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Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn			
2530	2535	2540	
Ser Val Trp Lys Asp Leu Leu Glu Asp Ser Val Thr Pro Ile Asp Thr			
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Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly			
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Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Lys Leu Pro Leu			
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2610	2615	2620	
Val Glu Phe Leu Val Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly			
2625	2630	2635	2640
Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp			
2645	2650	2655	

Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gln			
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Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly			
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Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg			
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Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr			
2705	2710	2715	2720
Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu Gln Asp Cys Thr			
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Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly			
2740	2745	2750	
Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr			
2755	2760	2765	
Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu			
2770	2775	2780	
Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly			
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Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu			
2805	2810	2815	
Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn Ser Trp			
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Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile			
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Leu Met Thr His Phe Phe Ser Val Leu Ile Ala Arg Asp Gln Leu Glu			
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Gln Ala Leu Asn Cys Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro			
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Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly Leu Ser Ala Phe			
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Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala Ala Cys			
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Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Ala Trp Arg His Arg Ala
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Arg Ser Val Arg Ala Arg Leu Leu Ser Arg Gly Gly Arg Ala Ala Ile
 2930 2935 2940

Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu Lys Leu
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Thr Pro Ile Ala Ala Ala Gly Arg Leu Asp Leu Ser Gly Trp Phe Thr
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Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg
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Pro Arg Trp Phe Trp Phe Cys Leu Leu Leu Leu Ala Ala Gly Val Gly
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<211> 9611

<212> DNA

<213> Hepatitis C virus

<400> 9

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<212> PRT

<213> Hepatitis C virus

<400> 10

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20 25 30

Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala

35 40 45

Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro

50 55 60

Ile Pro Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly

65 70 75 80

Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp

85 90 95

Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro

100 105 110

Arg His Arg Ser Arg Asn Val Gly Lys Val Ile Asp Thr Leu Thr Cys

115 120 125

Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Val Val Gly Ala Pro Leu

130 135 140

Gly Gly Val Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp

145 150 155 160

Gly Val Asn Phe Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile

165 170 175

Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Ala

180 185 190

Glu Val Lys Asn Ile Ser Thr Gly Tyr Met Val Thr Asn Asp Cys Thr

195 200 205

Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro

210 215 220

Gly Cys Val Pro Cys Glu Lys Val Gly Asn Ala Ser Gln Cys Trp Ile

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Gly Leu Arg Thr His Ile Asp Met Val Val Met Ser Ala Thr Leu Cys			
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Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Gly Val Met Leu Ala Ala			
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Gln Met Phe Ile Val Ser Pro Gln His His Trp Phe Val Gln Asp Cys			
290	295	300	
Asn Cys Ser Ile Tyr Pro Gly Thr Ile Thr Gly His Arg Met Ala Trp			
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Asp Met Met Met Asn Trp Ser Pro Thr Ala Thr Met Ile Leu Ala Tyr			
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Leu His Thr Gly Phe Ile Ala Ser Leu Phe Tyr Thr His Ser Phe Asn			
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Pro Glu Asp Met Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Gln Cys			

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Thr Thr Glu Trp Ala Ile Leu Pro Cys Ser Tyr Ser Asp Leu Pro Ala		
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Phe Met Tyr Gly Leu Ser Pro Ala Leu Thr Lys Tyr Ile Val Arg Trp		
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Glu Trp Val Ile Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys		
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Ala Cys Leu Trp Met Leu Ile Leu Leu Gly Gln Ala Glu Ala Ala Leu		

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Trp Leu Gln Tyr Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp		
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Val Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu		
865	870	875 880
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Val Pro Tyr Phe Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu		
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Ala Arg Lys Ile Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys		
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Leu Gly Ala Leu Thr Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu		
945	950	955 960
Arg Asp Trp Ala His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu		
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Pro Val Val Phe Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala		
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Asp Thr Ala Ala Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala		

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Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu		
1810	1815	1820
Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly		
1825	1830	1835 1840
Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu		
1845	1850	1855
Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile		
1860	1865	1870
Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro		
1875	1880	1885
Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val Cys Ala Ala		
1890	1895	1900
Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met		
1905	1910	1915 1920
Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr		
1925	1930	1935
His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu		
1940	1945	1950
Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile		
1955	1960	1965
Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile		
1970	1975	1980
Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys		
1985	1990	1995 2000
Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln		
2005	2010	2015
Arg Gly Tyr Arg Gly Val Trp Arg Gly Asp Gly Ile Met His Thr Arg		

2020	2025	2030
Cys His Cys Gly Ala Glu Ile Thr Gly His Val Lys Asn Gly Thr Met 2035	2040	2045
Arg Ile Val Gly Pro Arg Thr Cys Arg Asn Met Trp Ser Gly Thr Phe 2050	2055	2060
Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Leu Pro Ala Pro 2065	2070	2075 2080
Asn Tyr Lys Phe Ala Leu Trp Arg Val Ser Ala Glu Glu Tyr Val Glu 2085	2090	2095
Ile Arg Arg Val Gly Asp Phe His Tyr Val Ser Gly Met Thr Thr Asp 2100	2105	2110
Asn Leu Lys Cys Pro Cys Gln Ile Pro Ser Pro Glu Phe Phe Thr Glu 2115	2120	2125
Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro Cys Lys Pro Leu 2130	2135	2140
Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val 2145	2150	2155 2160
Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala Val Leu Thr 2165	2170	2175
Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg 2180	2185	2190
Arg Leu Ala Arg Gly Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser 2195	2200	2205
Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp 2210	2215	2220
Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu 2225	2230	2235 2240
Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile 2245	2250	2255
Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val 2260	2265	2270
Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg Ala		

2275	2280	2285
Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr		
2290	2295	2300
Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu		
2305	2310	2315 2320
Pro Pro Pro Arg Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr		
2325	2330	2335
Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala		
2340	2345	2350
Thr Lys Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn		
2355	2360	2365
Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser		
2370	2375	2380
Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly		
2385	2390	2395 2400
Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser Ser Gly Ala		
2405	2410	2415
Asp Thr Glu Asp Val Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly		
2420	2425	2430
Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys Leu Pro Ile Asn		
2435	2440	2445
Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr Ser Thr		
2450	2455	2460
Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val Thr Phe Asp Arg		
2465	2470	2475 2480
Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu Lys Glu Val Lys		
2485	2490	2495
Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala		
2500	2505	2510
Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly		
2515	2520	2525
Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn		

2530	2535	2540	
Ser Val Trp Lys Asp Leu Leu Glu Asp Ser Val Thr Pro Ile Asp Thr			
2545	2550	2555	2560
Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly			
2565	2570	2575	
Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly Val Arg			
2580	2585	2590	
Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Lys Leu Pro Leu			
2595	2600	2605	
Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly Gln Arg			
2610	2615	2620	
Val Glu Phe Leu Val Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly			
2625	2630	2635	2640
Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp			
2645	2650	2655	
Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gln			
2660	2665	2670	
Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly			
2675	2680	2685	
Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg			
2690	2695	2700	
Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr			
2705	2710	2715	2720
Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu Gln Asp Cys Thr			
2725	2730	2735	
Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly			
2740	2745	2750	
Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr			
2755	2760	2765	
Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu			
2770	2775	2780	
Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly			

2785	2790	2795	2800
Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu			
2805		2810	2815
Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn Ser Trp			
2820		2825	2830
Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile			
2835		2840	2845
Leu Met Thr His Phe Phe Ser Val Leu Ile Ala Arg Asp Gln Leu Glu			
2850		2855	2860
Gln Ala Leu Asn Cys Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro			
2865		2870	2875
Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly Leu Ser Ala Phe			
	2885	2890	2895
Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala Ala Cys			
	2900	2905	2910
Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Ala Trp Arg His Arg Ala			
	2915	2920	2925
Arg Ser Val Arg Ala Arg Leu Leu Ser Arg Gly Gly Arg Ala Ala Ile			
	2930	2935	2940
Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu Lys Leu			
2945		2950	2955
Thr Pro Ile Ala Ala Ala Gly Arg Leu Asp Leu Ser Gly Trp Phe Thr			
	2965	2970	2975
Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg			
	2980	2985	2990
Pro Arg Trp Phe Trp Phe Cys Leu Leu Leu Leu Ala Ala Gly Val Gly			
	2995	3000	3005
Ile Tyr Leu Leu Pro Asn Arg			
	3010	3015	

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24

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24

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22

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